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Professional Experience

2013-present	Senior Scientist for Climate and Weather, NOAA ESRL PSD
2005-present	Deputy Director for Research, PSD
2008	Acting Deputy Director for Research, ESRL
1995-2005	Director, NOAA-CIRES Climate Diagnostics Center
1991-1995	Meteorologist, CDC
1989-1991	Associate Professor, Dept. of Earth, Atmospheric and Planetary Sciences, MIT
1983-1988	Assistant Professor, MIT
1982-1983	Postdoctoral Research Fellow, Center for Earth and Planetary Physics, Harvard University
1976-1982	Teaching Assistant and Research Assistant, MIT

Education

1982	Ph. D., Massachusetts Institute of Technology, Cambridge, MA, Meteorology
1975	B.Sc., Cornell University, Ithaca, NY, Atmospheric Sciences

Honors

2013	NOAA Council of Fellows
2012	Department of Commerce Bronze Medal Award: Team member recognized "For developing a NOAA Administrative Order on Scientific Integrity Policy and accompanying Handbook on Scientific Misconduct."
2011	AAAS Electorate Nominating Committee, Atmospheric Sciences Section (elected by AAAS members)
2010	Fellow, American Meteorological Society
2008	NOAA Administrator's Award "For outstanding leadership in and dedication to developing U.S. Climate Change Science Program Synthesis and Assessment Products integrating climate research for decision support."
2007	Department of Commerce Bronze Medal Award "For superior federal service for designing and implementing the consolidation of six research organizations in Boulder, Colorado into the new NOAA Earth System Research Laboratory."
2006	Department of Commerce Bronze Medal Award "For developing an integrated state, local and federal strategy for a National Integrated Drought Information System endorsed by the Western Governors' Association."

2002	Department of Commerce Silver Medal Award “For developing the NOAA-CIRES Climate Diagnostics Center into a unique and valuable national resource for climate research.”
1999	Department of Commerce Bronze Medal Award “For extraordinary contributions to the design, development and implementation of the El Niño-Southern Oscillation Rapid Response Project.”
1995	Fellow, University of Colorado, Cooperative Institute for Research in Environmental Sciences.
1995	NOAA Outstanding Performance Award
1993	NOAA Sustained Superior Performance Award
1990	M.I.T. Award for Outstanding Teaching, Department of Earth, Atmospheric and Planetary Sciences
1982	M.I.T. Carl-Gustav Rossby Award for "The most outstanding thesis submitted to the Department of Meteorology and Physical Oceanography in 1982."
1982	Graduate with Honors and Distinction, Cornell University
Honorary Societies	Sigma Xi, Phi Kappa Psi, Hoh-nun-de-kah (Cornell honorary society)
Other honors	NCAR Summer Fellow, 1978
Presentations	Numerous invited presentations at scientific conferences and universities.
Media	Numerous interviews, including national and international media.
<i>Books</i>	Invited author, 8 book chapters and article in <i>Encyclopedia of Climate and Weather</i>

Additional Professional Activities

2013-	Co-chair, Organizing Committee for NOAA Science Challenge Workshop “Predicting Arctic Weather and Climate and Related Impacts: Status and Requirements for Progress”
2013	U.S. Delegation member to WMO Commission for Atmospheric Sciences-16
2013	NOAA drafting team, State of Science Fact Sheet on interpreting how climate change affects extreme events
2012	Steering Committee, Workshop on Attribution of Weather and Climate Extremes (joint US-UK sponsorship, held September 2012 in Oxford UK)
2011-present	WMO World Weather Research Programme, Joint Scientific Committee
2011-present	AAAS Electorate Nominating Committee for the Section on Atmospheric and Hydrospheric Sciences
2009-present	NASA Global Modeling and Assimilation Office, Advisory Board
2008-present	Cornell University, Department of Earth and Atmospheric Sciences, External Advisory Board
2005-present	Division Director, Weather and Climate Dynamics Division, Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder
2005-present	CIRES Executive Committee
1995-present	CIRES Fellow

2011 USGCRP Strategic Plan Writing Team for “Advance Science” chapter
 2011 U.S. Global Change Research Program, Strategic Plan Integration Team
 2011 NOAA Ad hoc Committee for NOAA Research Council on how NOAA manages and conducts its science; contributed to new Scientific Integrity Policy
 2011 Chair, NOAA Science Challenge Workshop “Toward Understanding and Predicting Regional Climate Variations and Change.” Led drafting of workshop report presented to NOAA Research Council.
 2010 Co-Chair, NOAA Science Workshop on “Strengthening NOAA Science”. Co-led drafting of workshop report presented to NOAA senior leadership.
 2009-2010 NWS Science and Technology Infusion Program – Climate team
 2009 Co-chair, NOAA team to develop a vision for climate services in NOAA
 2008 NOAA Climate Service Development Team
 2008 NOAA Tiger Team to evaluate options for a National Climate Service
 2008-2010 NOAA Climate Goal Capability Lead for “Analysis and Attribution” in Climate Research and Modeling Program
 2008 Steering Committee, Pacific Climate Information System (PaCIS)
 2008 NCAR Earth and Sun Systems Laboratory Advisory Panel
 2007-2010 NOAA Climate Goal capability lead for Climate Analysis and Attribution
 2007-2010 NOAA Climate Executive Board
 2006-2009 AMS Ad Hoc Committee on Education Planning
 2007 U.S. Delegation, for Intergovernmental Panel on Climate Change Working Group I Fourth Assessment Report, “Climate Change 2007: The Physical Science Basis”
 2006-2007 Co-organizer and co-chair, 2007 AMS Presidential Forum: “Climate Variations and Change as Manifested by Changes in Weather”
 2006 U.S. Government expert reviewer, IPCC WG1 Fourth Assessment Report
 2006 NOAA Executive Committee on Drought
 2006-2009 ESRL Science and Technology Council
 2005-2011 NOAA THORPEX Executive Committee
 2005-2008 Chair, Author team lead editor, and Lead agency representative, CCSP Synthesis and Assessment Product 1.3: “Reanalysis of Historical Climate Data for Key Atmospheric Features: Implications for Attribution of Causes of Observed Change”.
 2005-2006 CENR USGEO Subcommittee “Near-term Opportunity” task force on Drought
 2005 NOAA Climate Test Bed Oversight Board
 2005 Executive Board, Columbia University Cooperative Institute for Climate Applications and Research (CICAR)
 2005 CENR Subcommittee for Disaster Reduction “Grand Challenge” task force on Drought
 2003-2005 Core team member for plan to develop a National Integrated Drought Information System (NIDIS)
 2003-2004 NOAA Science Team on May 4-10, 2003 Tornado Outbreak
 2002-2003 Chair, Council of Boulder Laboratory Directors
 2002-2003 Chair, Tenant Directors Board, David Skaggs Research Center
 2002-2003 Co-lead author, “Climate Variability and Change” chapter, and contributing author of “Climate Modeling Strategy” chapter of the *U.S. CCSP Strategic Plan*

- 2001-2011 Co-chair, "Climate Variability and Change" Interagency Working Group of the U.S. Climate Change Science Program (CCSP)
- 1997-2001 Co-lead, NOAA Strategic Planning Team, "Implement Seasonal to Interannual Climate Forecasts"
- 1997 Scientific Organizing Committee, WMO WWRP Conference on Dynamical Extended Range Forecasting, Toulouse France
- 1996-1999 Chair, Advisory Committee, NCEP/NCAR Reanalysis, 1997-1999
- 1996 University of Colorado Center for Chaos & Complexity
- 1996-1998 CIRES Career Tracks Development Committee
- 1995-96 CU/CIRES Faculty Search Committee
- 1994-1997 AMS Committee, Atmospheric and Oceanic Waves and Stability.
- 1994-1996 Editor, *Monthly Weather Review*
- 1991 Scientific Advisory Panel, NOAA Dynamical Extended Range Forecast (DERF) Project Core Proposal
- 1986-1993 Associate Editor, *Monthly Weather Review*

Professional Societies

American Meteorological Society (Fellow), American Geophysical Union,
American Association for the Advancement of Science, Royal Meteorological Society (Fellow)

Academic teaching and advisory experience

Massachusetts Institute of Technology

Courses taught - Introduction to Meteorology I, Introduction to Meteorology II,
Seminar on Weather Prediction, Introductory Synoptic Meteorology, Advanced Synoptic
Meteorology, Topics in the Physics of Atmospheres, Seminar on Cyclogenesis
Seminar on Sources for Low-Frequency Variability: Observations and Theories

Primary Thesis Advisor for 5 Ph. D., 3 M.Sc.

Served on numerous Ph. D. Committees in meteorology and civil engineering/ hydrology

Research Interests

Climate-weather interactions

Attribution of weather and climate extremes; extreme event predictability

Earth system analysis

Selected Publications

Dole, R., and coauthors, 2013: The Making of an Extreme Event: Putting the Pieces Together.
Bull. Amer. Meteor. Soc., in press, doi:[10.1175/BAMS-D-12-00069.1](https://doi.org/10.1175/BAMS-D-12-00069.1).

Vose, R. and coauthors 2013: Monitoring and Understanding Changes in Extremes: Extratropical
Storms, Winds and Waves. *Bull. Amer. Meteor. Soc.*, 94, doi:[10.1175/BAMS-D-12-00162.1](https://doi.org/10.1175/BAMS-D-12-00162.1).

- Peterson, T. C., and Coauthors, 2013: Monitoring and Understanding Changes in Heat Waves, Cold Waves, Floods, and Droughts in the United States: State of Knowledge. *Bull. Amer. Meteor. Soc.*, **94**, 821–834, doi:[10.1175/BAMS-D-12-00066.1](https://doi.org/10.1175/BAMS-D-12-00066.1).
- Hoerling, M., A., Kumar, R. Dole, J. Nielsen Gammon, J. Eischeid, J. Perlwitz, X. Quan, T. Zhang, P. Pegion, and M. Chen, 2013: Anatomy of an Extreme Event. *J. Climate*, **26**, 2811–2832, doi:[10.1175/JCLI-D-12-00270.1](https://doi.org/10.1175/JCLI-D-12-00270.1).
- Stott, P. A., M. Allen, N. Christidis, R. M. Dole, M. Hoerling, C. Huntingford, P. Pall, J. Perlwitz, and D. Stone. 2013. Attribution of weather and climate-related events. In: *Climate Science for Serving Society: Research, Modeling and Prediction Priorities*, Eds. G. R. Asrar, J. W. Hurrell, Springer Science+Business Media, Dordrecht 307-337, doi:[10.1007/978-94-007-6692-1_12](https://doi.org/10.1007/978-94-007-6692-1_12).
- Hoerling, Martin P., Jon K. Eischeid, Xiao-Wei Quan, Henry F. Diaz, Robert S. Webb, Randall M. Dole, David R. Easterling, 2012: Is a Transition to Semipermanent Drought Conditions Imminent in the U.S. Great Plains? *J. Climate*, **25**, 8380–8386, doi:[10.1175/JCLI-D-12-00449.1](https://doi.org/10.1175/JCLI-D-12-00449.1).
- Galarneau, T., T. Hamill, R. Dole, and J. Perlwitz, 2012: A Multi-Scale Analysis of the Extreme Weather Events over Western Russian and Northern Pakistan During July 2010. *Mon. Wea. Rev.*, 140, 1639-1664, doi:[10.1175/MWR-D-11-00191.1](https://doi.org/10.1175/MWR-D-11-00191.1).
- .Dole, R., M. Hoerling, J. Perlwitz, J. Eischeid, P. Pegion, T. Zhang, X.-W. Quan, T. Xu, and D. Murray, 2011: Was there a basis for anticipating the 2010 Russian heat wave? *Geophys. Res. Lett.*, **38**, L06702, doi:[10.1029/2010GL046582](https://doi.org/10.1029/2010GL046582).
- Legler, D. and R.M. Dole, 2011: Evaluation of reanalyses—developing an Integrated Earth System Analysis (IESA) Capability. *EOS Trans. AGU*, 92, (20) 172, doi:[10.1029/2011EO200006](https://doi.org/10.1029/2011EO200006).
- Liebmann, B, R. M. Dole, C. Jones, I. Bladé, and D. Allured, 2010: Influence of choice of time period on global surface temperature trend estimates, *Bull. Amer. Meteor. Soc.*, **91**, 1485-1491, doi:[10.1175/2010BAMS3030.1](https://doi.org/10.1175/2010BAMS3030.1).
- Brunet, G., M. Shapiro, B. Hoskins, M. Moncrieff, R. Dole, G. Kiladis, B. Kirtman, A. Lorenc, B. Mills, R. Morss, S. Polavarapu, D. Rogers, J. Schaake, and J. Shukla, 2010: Collaboration of the weather and climate communities to advance subseasonal-to-seasonal prediction, *Bull. Amer. Meteor. Soc.*, **91**, 1397-1406, doi:[10.1175/2010BAMS3013.1](https://doi.org/10.1175/2010BAMS3013.1).
- Shapiro, M., J. Shukla, G. Brunet, C. Nobre, M. Béland, R. Dole, et al., 2010: An Earth-System Prediction Initiative for the Twenty-first Century. *Bull. Amer. Meteor. Soc.*, **91**, 1377–1388, doi:[10.1175/2010BAMS2944.1](https://doi.org/10.1175/2010BAMS2944.1).
- Trenberth, K.E., R. Dole, Y. Xue, K. Onogi, R. Dee, M. Balmaseda, M. Bosilovich, S. Schubert, W. Large, 2010: Atmospheric reanalyses: [A major resource for ocean product development](#)

- [and modeling](#). In proceedings: "OceanObs'09: Sustained Ocean Observations and Information for Society" Conference (Vol. 2), Venice, Italy, 21-25 September 2009, Hall, J., Harrison D.E. and Stammer, D., eds., ESA Publication WPP-306.
- Solomon, S., R. Dole, R. Feely, I. Held, W. Higgins, J. Payne, E. Shea, U. Varanasi, and M. Westley, 2009: A vision for climate services in NOAA. *Fisheries*, **34**, 607-609, doi: [10.1577/1548-8446-34-12](#).
- Dole, R.M., 2008: Linking Weather and Climate. *Meteor. Monogr.*, **33**, No. 55, 297-348, doi: [10.1175/0065-9401-33.55.297](#).
- Waliser, D., K. Weickmann, R. Dole, S. Schubert, O. Alves, C. Jones, M. Newman, H.-L. Pan, A. Roubicek, S. Saha, C. Smith, H. Van den Dool, F. Vitart, M. Wheeler, and J. Whitaker, 2006: The Experimental MJO Prediction Project. *Bull. Amer. Meteor. Soc.*, **87**, 425-431, doi: [10.1175/BAMS-87-4-425](#).
- Pulwarty, R.S., K.L. Jacobs, and R.M. Dole, 2005: The hardest working river: Drought and critical water problems in the Colorado River Basin. In: [Drought and Water Crises: Science, Technology, and Management Issues](#). D.A. Wilhite, ed., Marcel Dekker, Inc. New York, NY. pp. 249-286.
- Hamill, T.M., R.S. Schneider, H.E. Brooks, G.S. Forbes, H.B. Bluestein, M. Steinberg, D. Melendez, and R.M. Dole, 2005: The May 2003 Extended Tornado Outbreak. *Bull. Amer. Meteor. Soc.*, **86**, 531-542, doi: [10.1175/BAMS-86-4-531](#).
- Hamill, T.M., R. Schneider, H.E. Brooks, G. Forbes, H. Bluestein, M. Steinberg, D. Melendez, and R. Dole, 2005: Supplement to the May 2003 Extended Tornado Outbreak: Daily Maps. *Bull. Amer. Meteor. Soc.*, **86**, ES3-ES16, doi: [10.1175/BAMS-86-4-HamillA](#).
- Dole, R. M., 2003: "Predicting climate variations in the American West: What are our prospects?" [Water and Climate in the Western United States](#). W.M. Lewis Jr., ed., University Press of Colorado, Boulder, CO, pp. 9-28.
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- Lyon, B.F., and R.M. Dole, 1995: A diagnostic comparison of the 1980 and 1988 U.S. summer heat wave-droughts. *J. Climate*, **8**, 1658-1675, doi:[10.1175/1520-0442\(1995\)008<1658:ADCOTA>2.0.CO;2](https://doi.org/10.1175/1520-0442(1995)008<1658:ADCOTA>2.0.CO;2).
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- Whitaker, J.S., R.M. Dole, and K.L. Paine, 1994: Mechanisms for storm track variability. Part II: Model studies. In: *The Life Cycles of Extratropical Cyclones*. S. Gronas and M. A. Shapiro, eds., Bergen, Norway, Vol. II, ISBN: 8241901437, pp. 97-101.
- Black, R.X., and R.M. Dole, 1993: The dynamics of large-scale cyclogenesis over the North Pacific Ocean. *J. Atmos. Sci.*, **50**, 421-442, doi:[10.1175/1520-0469\(1993\)050<0421:TDOLSC>2.0.CO;2](https://doi.org/10.1175/1520-0469(1993)050<0421:TDOLSC>2.0.CO;2).
- Nielsen, J.W., and R.M. Dole, 1992: A survey of extratropical cyclone characteristics during GALE. *Mon. Wea. Rev.*, **120**, 1156-1167, doi:[10.1175/1520-0493\(1992\)120<1156:ASOECC>2.0.CO;2](https://doi.org/10.1175/1520-0493(1992)120<1156:ASOECC>2.0.CO;2).
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- Dole, R.M., and R.X. Black, 1990: Life cycles of persistent anomalies. Part II: The development of persistent negative height anomalies over the North Pacific Ocean. *Mon. Wea. Rev.*, **118**, 824-846, doi:[10.1175/1520-0493\(1990\)118<0824:LCOPAP>2.0.CO;2](https://doi.org/10.1175/1520-0493(1990)118<0824:LCOPAP>2.0.CO;2).
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Dole, R.M., 1986: The life cycles of persistent anomalies and blocking over the North Pacific. [*Advances in Geophysics: Anomalous atmospheric flows and blocking*](#), Academic Press, Inc., Orlando, **29**, 31-69.

Dole, R.M., 1986: Persistent anomalies of the extratropical Northern Hemisphere wintertime circulation: Structure. *Mon. Wea. Rev.*, **114**, 178-207, doi:[10.1175/1520-0493\(1986\)114<0178:PAOTEN>2.0.CO;2](#).

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Dole, R.M., 1983: Persistent anomalies of the extratropical Northern Hemisphere wintertime circulation. In: *Large-Scale Dynamical Processes in the Atmosphere*, B.J. Hoskins and R.P. Pearce, eds., Academic Press, NY, 95-109.

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U.S. and Interagency Research Program Reports

Dole, R.M., M. Hoerling and S. Schubert, eds., 2008: [*Reanalysis of Historical Climate Data for Key Atmospheric Features: Implications for Attribution of Causes of Observed Change*](#). A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. National Oceanic and Atmospheric Administration, National Climatic Data Center, Asheville, NC. 136 pp.

Schubert, S., R. Dole, H. van den Dool, M. Suarez, and D. Waliser, 2002: *Prospects for improving forecasts of weather and short-term climate variability on subseasonal (2-week to 2-month) time scales*. [NASA/TM-2002-104606](#), vol. 23, 171 pp.

NOAA Internal Reports

[*“Strengthening NOAA Science: Findings from the NOAA Science Workshop”*](#). April 20-22, 2010. Prepared by the NOAA Science Workshop Program Committee, P. Sandifer and R. Dole, co-chairs. 61 pp.

“Toward Advancing Understanding and Predictions of Regional Climate Variations and Change”. Prepared for the NOAA Research Council following the NOAA Science Challenge Workshop Sept. 20-22, 2011. R. Dole, chair. 32 pp.

Oral Presentations (past two years)

- 2013 “The Making of an Extreme Event: Putting the Pieces Together”. European Meteorological Society Annual Conference, Reading, UK.
- 2013 “The Making of an Extreme Event: Putting the Pieces Together”. Invited presentation, U.S. CLIVAR Workshop on Analyses, Dynamics and Modeling of Large Scale Meteorological Patterns Associated with Extreme Temperature and Precipitation.
- 2012 “Identifying the Causes of Weather and Climate Events to Improve Predictions”. Invited keynote presentation, NOAA 37th Annual Climate Diagnostics and Prediction Workshop, Fort Collins, CO.
- 2012 “Framing Event Attribution”. Invited presentation, Workshop on Attribution of Climate and Weather Extremes: Assessing, Anticipating and Communicating Climate Risks. Oxford UK.
- 2012 “Challenges in Attribution of Weather and Climate Extremes”, Invited presentation, University of Colorado Center for Science and Technology Policy. Boulder CO.
- 2012 “Physically-based Attribution of Weather and Climate Extremes”, Invited presentation, Banff Workshop on Frontiers in Detection and Attribution of Climate Change. Banff Canada.
- 2012 “Challenges in Attribution of Weather and Climate Extremes”, Invited presentation, NCAR Advanced Study Summer Colloquium The Weather-Climate Intersection: Advances and Challenges, Boulder, CO.
- 2011 “Was There a Basis for Anticipating the 2010 Russian Heat Wave?” Invited presentation, American Meteorological Society Annual Conference. Seattle, WA.
- 2011 “Understanding the Causes for the 2010 Russian Heat Wave: Implications for Extreme Heat Wave Predictions and Projections”, Invited presentation, International Union of Geodesy and Geophysics Conference. Melbourne, Australia.
- 2011 “Linking Weather and Climate”, Invited opening presentation, World Climate Research Programme Open Science